26871
S/081/61/000/013/003/028
B105/B201

24.4500

AUTHORS: Usmanov A. G., Berezhnoy A. N.

TITLE: The similarity method in the thermal diffusion of gases

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 13, 1961, 45, abstract 13Б328 (Tr. Kazansk. khim.-tekhnol. in-ta, 1959, vyp. 26, 176 - 182)

TEXT: The application of methods previously recommended (RZhKhim, 1959, No. 6, 18379) for thermal diffusion is studied in order to determine the separation and the values of the thermal diffusion constant α and of the thermal diffusion ratio K_T related herewith. The relative separation of binary gas mixtures in thermal diffusion is expressed by the equation $\Delta\lambda/\Delta\lambda_{\Delta S} = 1.986\ (S_1 - S_2)/R$, where $\Delta\lambda$ is the separation of the mixture with a change of entropy at the boundaries equal to $S_1 - S_2$; $\Delta\lambda_{\Delta S}$ is the separation of the mixture proportional to the change of entropy ΔS, which is counted from the constant beginning S_1; S_1 and S_2 are the values of the entropies of the hot and cold parts of the mixture in steady state; R is

Card 1/2

The similarity method in the...

the gas constant. This formula comprises more than 100 binary mixtures of mono-, di-, and polyatomic gases in various combinations. The deviation of the experimental points from the straight line, which is described on the basis of the foregoing equation, is usually not higher than 3 - 4 %. The equation makes it possible to interpolate experimental data on the separation of binary mixtures by thermal diffusion to a range of temperatur and concentrations that is not covered by the experiment. [Abstracter's note: Complete translation.]

Card 2/2

28055 S/137/61/000/004/001/039
A056/A101

11,3900

AUTHOR: Usmanov, A. G.

TITLE: Generalization of experimental data on viscosity and thermal conductivity of liquid metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1961, 3, abstract 4A21 (V sb. "Konvektivn. i luchistyy teploobmen", M., AN SSSR, 1960, 97-106)

TEXT: This is a generalization of experimental data concerning the coefficients of dynamic viscosity η and thermal conductivity λ for liquid metals (Na, K, Sn, Bi, Pb, Hg), on the basis of the molecular transfer equation and in the temperature limits: up to 700°C for K, Pb, Sn, Bi, up to 1,300°C for Na and up to 500°C for Hg. The calculations show that for the metals considered it is not possible to take a common origin to read-off entropies, so the metals were divided into groups: Na, K, Sn and Sn, Pb, Bi, Hg. Generalized relationships were plotted in coordinates relative flux versus relative variation of entropy. In the first group a good convergence both for η and λ has been obtained for Na and K. Sn has shown an increased deviation in the direction of greater

Card 1/2

Generalization of experimental data ...

relative fluxes. In the second group, all the metals have shown a uniform dependence. The drop of Sn from the first group attests that the metals of groups 1 and 2 have nothing in common between them, this fact being related to the structure difference between metals in liquid phase. Thus the proposed methods of experimental data generalization on the molecular transfer processes can be applied both to gaseous and to liquid phases.

F. A.

[Abstracter's note: Complete translation]

Card 2/2

22336

S/196/61/000/005/002/004
E073/E535

11.9400

AUTHORS: Usmanov, A.G. and Berezhnoy, A.N.

TITLE: Investigation of the Molecular and Thermal Diffusion by the Similarity Method

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, No.5, 1961, p.5, abstract 5G38. (Konvektivn. i luchistyy teploobmen, M., AS, USSR, 1960, 188-204)

TEXT: A generalization is given of experimental data on the diffusion coefficient in the gas phase based on the conceptions on similarity of molecular processes. If all the calculations are made on the basis of parameters that correspond to an arbitrary value of the entropy S, the relations for the densities of the diffusion flows are unequivocal functions of the entropy

$$\frac{I}{I_{\Delta S}} = \varphi\left(\frac{S_1 - S_2}{R}\right)$$

where I - density of the diffusion flux through a unit of thickness of the gas layer on changing the entropy at the

Card 1/3

boundaries by $S_2 - S_1$; $I_{\Delta S}$ - same for $\Delta S = S_1^1 - S_1$; R - universal gas constant. Applied to the coefficient of isothermal diffusion with a concentration gradient equalling unity, the above equation can be written as follows:

$$\frac{D}{D_{\Delta S}} = \varphi\left(\frac{S_1 - S_2}{R}\right)$$

This formula was verified for the diffusion of vapours from the surface of a number of liquids into a volume filled by other gases. The calculated values are in agreement with experimental data within 2%. In a table, which is included, data are given which were obtained by calculation according to the general relationship governing the diffusion coefficient for a number of temperatures. A similar assumption of the generalization was applied for the process of thermodiffusional separation of binary gas mixtures within wide ranges of temperatures and concentrations. The generalized relation for the process of thermal diffusion is

described by the straight line equation

$$\frac{\Delta\lambda}{\Delta\lambda_{\Delta S}} = 1.986 \frac{S_1 - S_2}{R}$$

where $\Delta\lambda$ - magnitude of the thermodiffusional separation of the mixture on changing the entropy at the boundaries by $S_1 - S_2$; $\Delta\lambda_{\Delta S}$ - magnitude of the size separation of the mixture on changing the entropy ΔS counted from the constant value S_1; S_1 and S_2 - entropy values of the hot and cold parts of the mixture in the stationary state. The separation values are calculated for the mixtures helium-xenon, helium-krypton and hydrogen-deuterium within wide ranges of concentrations and temperatures. 42 references.
Abstracted by V. Lyusternik.

[Abstractor's note: Complete translation.]

Card 3/3

S/124/61/000/012/027/038
D237/D304

AUTHORS: Usmanov, A. G., and Berezhnoy, A. N.

TITLE: Investigating molecular and thermal diffusion by the similarity method

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 12, 1961, 106, abstract 12B738 (V sb. Konvektisn. i luchistyy teploobmen. M., AN SSSR, 1960, 188-204)

TEXT: Starting from some not very clearly formulated assumptions concerning the character of the dependence of the coefficient of gaseous diffusion and thermodiffusive parameter for various gas mixtures on thermodynamic magnitudes, the authors suppose that a simple relation exists and is true for all gases. In particular, it is stated that these magnitudes depend only on two characteristic entropy values, appearing in the design of the experiment, from which the above coefficients

Card 1/2

Investigating molecular and... S/124/61/000/012/027/038
D237/D304

are determined. The processing of the large amount of experimental data obtained apparently confirms the supposition of universality and simplicity of the above-mentioned relations. Graphs and tables are given, based on experimental data. The result obtained is useful insofar as it enables one to determine coefficients of diffusion and thermal diffusion parameters for the conditions outside the experimental ones. [Abstracter's note: Complete translation.]

Card 2/2

5.4700

AUTHORS: Usmanov, A. G., Berezhnoy, A. N.

69664
S/153/60/003/01/002/058
B011/B005

TITLE: Generalization of Experimental Data on Thermal Diffusion of Gases

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol 3, Nr 1, pp 8-13 (USSR)

TEXT: The authors indicate an equation: $\frac{\Delta\lambda}{\Delta\lambda_{\Delta S}} = 1.986 \frac{S_1 - S_2}{R}$ (2) to express the separation of binary gas mixtures in thermal diffusion. The separation by thermal diffusion, and other values of gas mixtures connected with it, can be determined by this equation in a wide range of temperatures and compositions. In their paper, the authors discuss the method of generalizing experimental data on molecular transport in gases (Ref 1), to determine the thermodiffusion constant α and the thermodiffusion relation k_T. By thermal diffusion, the system comes into a state in which the effects of separation and mixture counterbalance each other. The final result of the two steady processes is expressed by the above equation (2) where $\Delta\lambda$ is the separation of the mixture at a change of entropy within the limits $S_1 - S_2$; $\Delta\lambda_{\Delta S}$ is the separation of the mixture at a change of entropy ΔS calculated from a constant beginning S_1; S_1 and S_2 are entropy values of the hot and cold portions of

Card 1/3

the mixture in a stationary state; R is the universal gas constant. The generalization comprises more than 100 binary mixtures of 1-, 2-, and polyatomic gases in various combinations. The results obtained are represented in the coordinate system $\frac{\Delta\lambda}{\Delta\lambda_{\Delta_0}}$ and $\frac{S_1-S_2}{R}$ in figures 1-4. They are satisfactorily described by equation (2). Table 1 shows, as an example, the values of separation for the mixtures He - Kr and He - Xe calculated by equation (2). They are in good agreement with the experimental results. Table 2 gives average values of α for mixtures with equal content of components before separation. Table 3 gives the values of $\Delta\lambda$, k_T and α for the H_2 - D_2 mixture in a wide range of concentrations and temperatures. Similar results can be obtained for other binary mixtures. On the basis of this paper, data can be calculated by interpolation in a temperature- and concentration range which is not covered by the experiment. There are 4 figures, 3 tables, and 8 references, 4 of which are Soviet.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskiy institut im. S. M. Kirova; Kafedra teplot khniki (Kazan' Institute of Chemical Technology

69664
S/153/60/003/01/002/018
B011/B003

Generalization of Experimental Data on Thermal Diffusion of Gases

imeni S. M. Kirov; Chair of Heat Engineering)

SUBMITTED: October 2, 1958

Card 3/3

S/076/60/034/04/33/042
B010/B009

AUTHORS: Usmanov, A. G., Berezhnoy, A. N. (Kazan')

TITLE: Application of the Similarity Method in the Investigation of Mass Transfer Processes

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 907 - 920

TEXT: Since the effect of thermal diffusion is used in engineering for the separation of gas mixtures, the diffusion and thermodiffusion mass transfers have already been investigated many times. In the present case these problems are studied in the light of the similarity of molecular processes. Two geometrically similar subsystems containing the same number of molecules with the same degrees of freedom are discussed. Subsequently, the generalized functions and examples for their application for the determination of the mass transfer coefficients are given. Table 1, moreover, contains the diffusion coefficients of vapors of various liquids in a temperature and concentration range not covered by the experiments, but calculated from the functions derived. Experiments with binary gas mixtures of Ar, Kr, Xe, and N_2 with H_2 as well as Kr and Xe showed that the sepa-

Application of the Similarity Method in the Investigation of Mass Transfer Processes

S/076/60/034/04/33/042
B010/B009

ration of these mixtures by thermodiffusion may be described by equation (III) of a straight line (Table 2, data for the mixture $H_2 - D_2$). By means of an interpolation in the range of the given generalization further data concerning the thermodiffusion separation of binary gas mixtures may be obtained for temperatures and concentrations otherwise not covered. There are 6 figures, 2 tables, and 22 references, 7 of which are Soviet.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskiy institut im. S. M. Kirova (Kazan' Institute of Chemical Engineering imeni S. M. Kirov)

SUBMITTED: March 30, 1957 (initially) and December 4, 1958 (after revision)

Card 2/2

S/153/62/005/006/012/015
E075/E336

AUTHORS: Usmanov, A.G. and Mukhamedzyanov, G.Kh.

TITLE: Application of the similarity methods for the investigation of the viscosity and heat-conductivity of liquids

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Khimiya i khimicheskaya tekhnologiya, v. 5, no. 6, 1962, 986 - 994

TEXT: The available viscosity and heat-conductivity data for liquids were related to their entropy changes to widen the present concept of molecular transfer processes. The relations examined were:

$$\frac{\eta}{\eta_{s_1}} = \varphi_1\left(\frac{S_1 - S}{R}\right) \qquad (2)$$

Card 1/4

$$\frac{\lambda}{\lambda_{s_1}} = \varphi_2\left(\frac{S_1 - S}{R}\right) \qquad (3)$$

where η and λ - coefficients of kinematic viscosity and heat-conductivity, respectively, of a liquid corresponding to its entropy S, η_{s_1} and λ_{s_1} - the same values corresponding to entropy S_1 and R - gas constant. The liquids considered were: bromobenzene, toluene, cyclohexane, chlorobenzene, cyclopentane, chloroform, aniline, isopropyl alcohol, ethyl alcohol, n-propyl alcohol, diethyl ether, benzene, acetic acid, acetone, pyridine, methyl alcohol, n-butyl alcohol, carbon tetrachloride and nitrobenzene. The heat conductivities of the liquids conformed with Eq. (3) and the data for non-associated liquids could be expressed by:

$$\lambda = \lambda_{s_1}\left[1 + 0.028\left(\frac{S_1 - S}{R}\right)\right] \qquad (4)$$

and the data for associated liquids were expressed by:

$$\lambda = \lambda_{s_1}\left[1 + 0.015\left(\frac{S_1 - S}{R}\right)\right] \qquad (5) .$$

A smooth curve was obtained when η/η_{s_1} for the liquids were plotted against $(S_1 - S)/R$ with a good fit of all experimental points. The viscosity relation was also examined for liquid K, Na, Bi, Pb, Sb, Ce, Cd and four alloys of Pb and Bi. The viscosity data conform well with:

Card 3/4

Application of ....

S/153/62/005/006/012/015
E075/E336

$$\eta = \eta_{s_1} e^{0.346\left(\frac{S_1 - S}{R}\right)} \quad (7).$$

Using this equation the viscosities of Na were obtained up to 1 300 °C, Cd up to 1 150 °C, and Pb up to 950 °C, the viscosities available in the literature being given only up to 600 - 700 °C. Similarly for acetone, toluene, ethyl ether, methyl-, ethyl- and n-butyl alcohols the heat conductivities were obtained down to -80 °C. Thus, λ and η of various liquids can be determined for a wide temperature range if their entropies are available. There are 5 figures and 2 tables.

ASSOCIATION: Kafedra teplotekhniki, Kazanskiy khimiko-tekhnologicheskiy institut im. S.M. Kirova (Department of Heat Engineering, Kazan' Institute of Chemical Technology im. S.M. Kirov)

SUBMITTED: October 9, 1961

Card 4/4

USMANOV, A.G.; BAKIROV, N.U.

Viscosity and heat conduction in gases at high pressures. Izv.vys. ucheb.zav.; neft' i gaz 5 no.12:69-75 '62. (MIRA 17:4)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova.

USMANOV, A.G.; BAKIROV, N.U.

Application of similarity methods for the study of [illegible] properties of water vapor. Zhur. fiz. khim. 36 no.3:591-595 Mr '62. (MIRA 17:8)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova.

USMANOV, A. G.; MAGARRA, R. I.

Application of the similitude method in chemical kinetics.
Zhur. fiz. khim. 36 no.12:2680-2686 D '62.
(MIRA 16:1)

1. Kazanskiy khimiko-tekhnicheskiy institut imeni Kirova.

(Chemical models) (Chemical reaction, Rate of)

L 11136-63 EWT(1)/EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3000478 S/0153/63/006/001/0147/0154

54
53

AUTHOR: Usmanov, A. G.; Nafikov, E. M.

TITLE: The application of the similarity method to the investigation of diffusion processes in gases

SOURCE: Izv. VUZ: Khimiya i khim. tekhnologiya, v. 6, no. 1, 1963, 147-154

TOPIC TAGS: diffusion processes, diffusion coefficients, method of similarity, high-temperature diffusion

ABSTRACT: The wide use of high temperature processes requires the knowledge of diffusion coefficients (d.c.'s) of gases as a function of temperature. Theoretical calculations and various empirical and semi-empirical formulas have been used for computation of the d.c.'s, but none of these can be reliably extended to temperatures of interest to present day technology. Experimental determinations at high temperatures are connected with great practical difficulties. The temperature dependence of the d.c. was obtained on the basis of the method of similarity applied to transport processes by A. G. Usmanov and A. N. Berezhnoy (Zh. fiz. khimii, 34, 907, 1960). For two subsystems composed of an equal number of molecules with equal number of degrees of freedom, the functional relationship shown in eq. 1 of the enclosure (using

Card 1/2

L 11136-63

ACCESSION NR: AP3000478

entropy instead of temperature as the independent variable) was thus obtained. Plots of the experimental diffusion coefficients for 27 binary systems exhibited 5 different curves having the form of eq. 1, the different curves corresponding to the different number of degrees of freedom in the mono-mono, mono-di, di-di, di-tri, and poly-poly atomic systems. The curves can be represented by functions of the form shown in eq. 2 of the enclosure. It was shown that these functions can be put in the form of the well-known empirical formula (eq. 3), by using the exponent exhibited in eq. 4. In practice one is interested in systems limited to a constant volume and composed of an unequal number of particles. In this case, the similarity method predicts the functional relationship, eq. 5. A plot of experimental values of the d.c. gave an exponential relationship between the d.c. and the entropy shown in eq. 6, for all binary gas combinations. Using this dependence, the diffusion coefficients for various temperatures (273-1573K) for the system nitrogen-NO were calculated. It is possible to apply the same treatment to the calculation of the d.c.'s of any other pair of gases. Orig. art. has: 2 figures, 28 formulas, and 3 tables.

ASSOCIATION: Kafedra teplotekhniki, Kazanskiy khimiko-tekhnologicheskiy institut im. S. M. Kirova (Department of Heat Technology, Kazan' Chemical Technological Institute)

SUBMITTED: 05Jan62 DATE ACQD: 21Jun63 ENCL: 04

SUB CODE: CH, PH NO REF SOV: 003 OTHER: 031

Card 2/2

USMANOV, A.G.; MUKHAMEDZYANOV, G.Kh.

Generalization of experimental data on diffusion in liquids. Izv.vys.ucheb.zav.; khim. i khim. tekh. 6 no.6:930-937 '63. (MIRA 17:4)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni S.M.Kirova, kafedra teplotekhniki.

MUKHAMEDZYANOV, G.Kh.; USMANOV, A.G.; TARZIMANOV, A.A.

Experimental determination of the heat transmission of liquid saturated hydrocarbons. Izv.vys.ucheb.zav.; neft' i gaz 6 no. 9:75-80 '63. (MIRA 17:2)

1 Kazanskiy khimiko-tekhnologicheskiy institut im. S.M.Kirova.

24896

S/076/63/037/001/017/029
B101/B186

5.4000

AUTHORS: Usmanov, A. G., Berezhnoy, A. N.

TITLE: An equation for calculating the diffusion coefficient of vapors

PERIODICAL: Zhurnal fizicheskoy khimii, v. 37, no. 1, 1963, 179 - 181

TEXT: An improved equation is given for the diffusion coefficient: $D = 1.012 D_{\Delta S} [(S_1 - S)/R]^{0.141}$, where D and $D_{\Delta S}$ are the diffusion coefficients in the intervals of the change in entropy $S_1 - S$ and $\Delta S = S_1' - S_1$, respectively. S_1 is the entropy of the saturated vapor directly on the surface of the liquid and is calculated from $S_1 = S_v r_v + S_g r_g - R(r_v \ln r_v + r_g \ln r_g)$, where S_v and S_g are the molar entropies of the vapor and of the gas and r_v, r_g are the molar part of the vapor and of the gas on the surface of the liquid. S is the entropy at the end of the open tube within which diffusion occurs; equal to the entropy of the gas into which the vapor diffuses. The values of $D_{\Delta S}$ (cm^2/sec) for the diffusion of various organic

Card 1/2

S/076/63/037/001/017/029
B101/B186

An equation for calculating...

vapors into air O_2, H_2, N_2, Ar + He, Ar, Ne, D_2, and CO_2 are tabulated. The mean deviation of the calculated values from those obtained by experiment is ±1.2% and the maximum error amounts to 4 - 5% for five points. The equation offers a means of calculating those values of D for $(S_1 - S)/R = 0.00 - 6.00$ entropy units that have hitherto not been determined experimentally. There are 1 figure and 1 table.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskiy institut im. S. M. Kirova (Kazan' Institute of Chemical Technology imeni S. M. Kirov)

SUBMITTED: May 27, 1961

Card 2/2

GRIGOR'YEV, L. N.; KHAYRULLIN, I. KH.; USMANOV, A. G.

"Experimental investigation of critical heat flows with boiling binary mixture."

paper submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Chemical-Technical Inst, Kazan'.

PANFILOVICH, K. B.; USMANOV, A. G.

"Application of similarity methods for calculation of Co_2 and water-vapour radiation at high pressures."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Kazan' Chemical Technology Inst.

DYAKONOV, S. G.; USMANOV, A. G.

"Application of similarity theory to statistical analysis of anisotropic turbulence."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Kazan' Chemical-Technological Inst

L 31356-65 EPA(s)-2/EWT(m) EPF(n)-2/EWG(v)/EPR/EWP(j)/T/EPA(bb)-2/

ACCESSION NR: AP4049291

AUTHOR: Mukhamedzyanov, G. Kh.; Usmanov, A. G.; Tarzimanov, A. A. 3

TITLE: Measurement of the heat conductivity of organic liquids and their mixtures 12

SOURCE: IVUZ. Neft' i gaz, no. 10, 1964, 70-74

TOPIC TAGS: organic liquid, organic mixture, thermal conductivity, organic liquid conductivity, addition law

ABSTRACT: No rules have yet been found relating the heat conductivity of organic liquid mixtures to their composition. The only known experimental papers are by L. P. Filipov and N.S. Novoselova (Vestnik MGU, no. 3, 1955, p. 37; no. 8, 1955, p. 67), L. Riedel (Chem. Ing. Tech., no. 19, 1951, p. 465), and O.K. Bates et al. (Ind. Eng. Chem., 10, 1938, p. 314; 33, 1941, p. 375; 37, 1945, p. 193). The present paper reports on studies of the thermal conductivity of 17 binary organic mixtures of varying composition. The results concerning pure normal and associated liquids were published earlier (G. Kh. Mukhamedzyanov et al., Neft' i gaz, no. 9, 1963; no. 1, 1964). The first of these papers also described the apparatus used for the heat conduction measurements. The tests showed that the heat conductivity of organic mixtures deviates from the addition law

Card 1/2

L 31360-65

ACCESSION NR: AP4049291

in all cases. The smallest deviations are found in mixtures of components whose heat conductivities are of similar magnitude. However, for practical purposes (within a 5% accuracy), the heat conductivity may be calculated by the addition law if the concentrations of the components of a mixture are expressed in weight fractions. Orig. art. has: 4 figures, 1 table and 1 formula.

ASSOCIATION: Kazanskiy khimiko-tekhnologicheskiy institut im. S.M. Kirova (Kazan' chemical engineering institute)

SUBMITTED: 13Sep63 ENCL: 00 SUB CODE: TD, OC

NO REF SOV: 007 OTHER: 005

Card 2/2

MUKHAMETZYANOV, G.Kh.; TARZIMANOV, A.A.; USMANOV, A.G.

Experimental investigation of the heat conduction of normal alcohols. Izv.vys.ucheb.zav.;neft' i gaz no. 1: 73-75 '64. (MIRA 17:7)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni S.M.Kirova.

BAKIROV, M.U.; USMANOV, A.G.

Simulation methods in the investigation of the viscosity and heat conductivity of gases and gas mixtures. Izv. vys. ucheb. zav.; neft' i gaz 7 no.3:79-80 '64. (MIRA 17:6)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova.

MUKHAMEDZYANOV, G.Kh.; USMANOV, A.G.

Generalizing test data on the coefficients of the heat conductivity of fluids and their mixtures. Izv. vys. ucheb. zav.; neft' i gaz 8 no.4:67-71 '65. (MIRA 18:5)

1. Kazanskiy khimiko-tekhnologicheskiy institut im. S.M.Kirova.

L 23979-66 EWT(d)/EWT(l)/EWP(m) IJP(c) GS

ACC NR: AT6006923 SOURCE CODE: UR/0000/65/000/000/0369/0376

AUTHOR: D'yakonov, S. G.; Usmanov, A. G.

ORG: Kazan Chemico-technological Institute (Kazanskiy khimiko-tekhnologicheskiy institut)

TITLE: Application of similarity theory in statistical analysis of anisotropic turbulence

SOURCE: Teplo- i massoperenos. t. II: Teplo- i massoperenos pri vzaimodeystvii tel s potokami zhidkostey i gazov (Heat and mass transfer. v. 2: Heat and mass transfer in the interaction of bodies with liquid and gas flows). Minsk, Nauka i tekhnika, 1965, 369-376

TOPIC TAGS: anisotropic medium, fluid flow, statistic analysis, similarity theory

ABSTRACT: Assuming the similarity of systems with a large number of degrees of freedom, the authors attempt to evaluate the distribution function for the turbulent velocity pulsations in anisotropic turbulence. This offers the possibility of solving the Reynolds equation. The situation can be presented in the form of the functional relationship:

$$U = D\varphi(\Delta S),$$

Card 1/2

ACC NR: AT6006923

in which the form of the function remains identical for systems with an identical mechanism of internal transfer. The article demonstrates by an extended mathematical development that use of the above kinetic entropy equation for investigation of anisotropic turbulence makes it possible to close the system of equations for the turbulence and to obtain information on the internal structure of flow with transverse slip, without assumptions of any kind as to the distribution of any of the variables over the cross section of the flow. Orig. art. has: 24 formulas.

SUB CODE: 20/ SUBM DATE: 09Nov65/ ORIG REF: 002/ OTH REF: 002

USMANOV, A.G.; BEREZHNOY, A.N.

Characteristics of the thermodiffusional mass transfer calculated on the base of generalized relationships. Izv.vys.ucheb.zav.; khim. i khim.tekh. 8 no.2:218-223 '65.

(MIRA 18:8)

1. Kazanskiy khimiko-tekhnologicheskiy institut imeni Kirova, kafedra teplotekhniki.

USMANOV, A.G., PANKEVICH, K.B.

Some regularities in radiation of NH_3, SO_2, H_2O, CO_2, CO gases. Zhur. fiz. khim. 39 no.5:1123-1126 My '65. (MIRA 18:8)

1. Kazanskiy khimiko-tekhnologicheskiy institut.

ACC NR: AT6029318 SOURCE CODE: UR/0000/66/000/000/0213/0220

AUTHOR: D'yakonov, V. G.; Usmanov, A. G.

ORG: none

TITLE: Boiling heat transfer on a surface with direct high frequency heating

SOURCE: Moscow. Energeticheskiy institut. Teploobmen v elementakh energeticheskikh ustanovok (Heat exchange in power installation units). Moscow, Izd-vo Nauka, 1966, 213-220

TOPIC TAGS: turbulent heat transfer, heat transfer coefficient, alternating electromagnetic field

ABSTRACT: With the application of conventional heating methods (direct current, alternating 50 cycle current, steam heating) the temperature of the outside surface of the tube, which is necessary for calculation of the heat transfer coefficient, is calculated by the equations:

$$t_{w\,out} = t_{w\,in} + 0; \qquad (1)$$

$$0 = \frac{qd_{w\,out}}{4\lambda}\left[1 - \frac{2\ln\frac{d_{w\,out}}{d_{w\,in}}}{\left(\frac{d_{w\,out}}{d_{w\,in}}\right)^2 - 1}\right]. \qquad (2)$$

Card 1/2

ACC NR: AT6029318

Here, t_{in} is the temperature of the inner surface; t_{out} is the temperature of the outer surface; θ is the temperature difference between the inner and outer surfaces; q is the specific heat flux; λ is the heat conductivity of the flow; d_{out} and d_{in} are the outside and inside diameters of the tube. However, calculation of the value of θ by Equation (2) leads to a large error, in some cases up to 17.5%. This leads to an error in the calculation of the heat transfer coefficient

$$\alpha = \frac{q}{\Delta t} = \frac{q}{t_{out} - t_{in}}, \qquad (3)$$

With the aim of reducing these errors, experiments were carried out using a high frequency generator, Type GL-15, with a vibrational power of 8.5 kilowatts, and a working frequency of 650 kilocycles. Tests were made with a variety of liquids: benzene, ethanol, methanol, carbon tetrachloride, acetone, and double-distilled water. Detailed results are given in tabular form. The results demonstrate the effect of a rapidly alternating electromagnetic field on the intensity of heat transfer in the boiling of various liquids. It can be assumed that this effect can be explained by the interaction of the molecules of the boiling liquid with the high frequency electromagnetic field, leading to an increase in the number of active vapor formation centers. Orig. art. has: 10 formulas, 3 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 05Apr66/ ORIG REF: 004/ OTH REF: 001

Card 2/2

ACCESSION NR: AP4038006 S/0170/64/000/005/0112/0118

AUTHOR: Usmanov, A. I.

TITLE: Discharge of liquid into subsonic air flow

SOURCE: Inzhenerno-fizicheskiy zhurnal, no. 5, 1964, 112-118

TOPIC TAGS: subsonic air flow, discharge coefficient, air flow velocity, pressure loss coefficient, combustion, liquid injection, fuel injection, fuel injector, jet engine

ABSTRACT: A wind tunnel investigation was made of the discharge of kerosene through nozzles 3 mm in diameter located on cylindrical or flat surfaces of models placed in subsonic air streams. The dependence of the exit pressure loss coefficients (ζ_0) and discharge coefficient (q) on the flow parameters was determined. In the experiments, models with series of holes were installed in a wind tunnel at zero angle of attack. The holes in the models were made to ensure injection of kerosene perpendicular to the air stream. The nondimensional pressure difference at the exit

$$(\overline{\Delta p}_{ex} = (p_{0_{ex}} - p_\infty)/p_\infty$$

Card 1/3

ACCESSION NR: AP4038006

was varied during the experiments from 0 to 0.4 relative to the static pressure in the free-stream air flow. It was determined that the direction of flow of the liquid film along the surface as well as its width are practically independent of the pressure difference Δp_{ex} but are a function of the direction of the air stream and its velocity. The following conclusions are drawn: 1. At a constant pressure difference $\overline{\Delta p_{ex}}$, an increase in the air flow velocity past the model causes a several fold increase in the overall pressure loss coefficient at the exit, ζ^*_{ex}, and a decrease in the discharge coefficient q. 2. The coefficients q and ζ^*_{ex} can be correlated by the formula:

$$q = \sqrt{(\zeta_0 + \zeta_{def})(\zeta^*_{ex})^{-1}}.$$

3. At $\Delta p_{ex} > [\Delta p_{ex} M_\infty)]^*$, which corresponds to a regime in which the liquid separates from the surface, the value of ζ^*_{ex} decreases by a hyperbolic law and asymptotically approaches the value $\zeta^*_{ex} = \zeta_0$. 4. In the range $0.8 \geq M_\infty \geq 0.3$, the influence of gravitational forces is negligible. In the foregoing, M_∞ = free-stream Mach number; p_∞ = static free-stream pressure; Δp_{ex} = pressure difference at exit; p_{0ex} = full liquid pressure at exit. The actual discharge velocity was

Card 2/3

ACCESSION NR: AP4038006

found to be dependent on Δp_{ex} but independent of the air flow velocity. Graphs were obtained for the boundaries of the liquid film on the surface as a function of flow parameters and injection pressure. Orig. art. has: 4 figures and 16 formulas.

ASSOCIATION: none

SUBMITTED: 09May63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: PR NO REF SOV: 002 OTHER: 002

ATD PRESS: 3041

Card 3/3

USMANOV, A.U.

[Angren Valley floodland forest vegetation and its particularities] Tugainaia rastitel'nost' doliny reki Angren i ee osobennosti. Tashkent, Akademiia nauk UzSSR, 1953. 61 p. (MLRA 8:1)
(Angren Valley--Botany)

USMANOV, A. U.

Arboreal and Dumose Plants of Kara-Kalpak ASSR
Kokl. AN UzSSR, No 9, 1953, pp 28-31

The author presents a list of 30 artificially introduced and 15 local wild-growing species of trees and shrubs growing in Kara-Kalpakskaya ASSR. (RZhGeol, No 3, 1955)

SO: Sum. No. 639, 2 Sep 55

USMANOV, A.U.; SLAVKINA, T.I.; MURZOVA, R.M.

Notes on the botanical expedition to the Fergana Valley and southern Kirghizia. Trudy Bot.sada AN Uz.SSR no.5:133-139 '56. (MLRA 10:2)
(Kirghizistan--Botany)

USMANOV, A.U.

Growing certain poplars in Tashkent. Dokl. AN Uz. SSR no.9:49-52 '59. (MIRA 13:1)

1.Botanicheskiy sad AN UzSSR. Predstavleno chlenom-korrespondentom AN UzSSR F.N. Rusanovym.
(Tashkent--Poplar)

USMANOV, A.U.

Some biological characteristics of the variable-leaved poplar Populus ariana. Dokl. AN Uz.SSR no.10:51-53 '59 (MIRA 13:3)

1. Botanicheskiy sad ANOUzSSR. Predstavleno chlenom-korrespondentom AN UzSSR F. N. Rusanovym.
(Poplar)

USMANOV, A.U.

Fast-growing poplars. Uzb.biol.zhur. no.1:41-45 '60.

1. Botanicheskiy sad AN UzSSR. (MIRA 13:6)
(POPLAR)

S/169/62/000/005/010/093
D228/D307

AUTHORS: Ikramov, M. I. and Usmanov, A. U.

TITLE: Some general regularities of a statistical character, peculiar to the seismicity of the territory of Central Asia. Determination of the direction of the seismic strike of the territory of Central Asia by methods of mathematical statistics

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 5, 1962, 20, abstract 5A143 (Tr. Samarkandsk. un-ta, no. 107, 1960 (1961), 129-136)

TEXT: On the grounds of the coordinates of the epicenters of 5400 earthquakes, cited in the bulletin of seismic stations for 1951-1955, the normal distribution of earthquake epicenters and the general strike directions of the seismic zones on Central Asia's territory are established by methods of mathematical statistics. Equations are found for the straight regressions of longitude to

Card 1/2

Some general regularities ...

S/169/62/000/005/010/093
D228/D307

latitude and latitude to longitude. It is noted that the epicenters of strong earthquakes (M>4), which occurred in Central Asia in 1957-1958, are located near the regression lines or between them, i.e. the foci in this zone have a normal distribution. [Abstracter's note: Complete translation.]

Card 2/2

S/044/62/000/006/065/127
B168/B112

AUTHORS: Ikramov, M. I., Usmanov, A. U.

TITLE: Certain general statistical laws governing the seismicity of the territory of Central Asia. Determination of the direction of the seismic trend in Central Asia by methods of mathematical statistics

PERIODICAL: Referativnyy zhurnal. Matematika, no. 6, 1962, 15, abstract 6V76 (Tr. Samarkandsk. un-ta, no. 107, 1960(1961), 129-136)

TEXT: Certain statistical characteristics for the coordinates (geographical latitude and longitude) of the epicenters of earthquakes in Central Asia are set up. A total of 5400 earthquakes recorded by a network of seismic stations in the Soviet Union during the years 1951-1955 were used. Histograms of coordinates of the epicenters, which are found to be close to the normal density, are plotted. In addition, empirical regression curves for these coordinates, approximated by straight lines and sinusoids, are found. [Abstracter's note: Complete translation.]

Card 1/1

USMANOV, B.

Some problems in the development of water management in Andizhan Province. Gidr. i mel. 15 no.3:27-30 Mr '63. (MIRA 16:4)

(Andizhan Province--Irrigation)

KHAMRABAYEV, I.Kh., doktor geol.-miner. nauk; RADZHABOV, F.Sh.; GOR'KOVOY, O.P.; SALOV, P.I.; KOZYREV, V.V.; PETROV, V.M.; USMANOV, F.A.; ISAMUKHAMEDOV, I.M., doktor geol.-min. nauk; KUSTARNIKOVA, A.A.; BORISOV, O.M.; RAKHMATULLAYEV, Kh.R.; MUSAYEV, A.M.; SVIRIDENKO, A.F.; SULTAN-UIZ-DAG; GOLOVIN, Ye.M., kand. geol.-miner. nauk; VIS'NEVSKIY, Ya.S., kand. geol.-miner. nauk, red.; NURATDINOVA, M.R., red.; ASTAKHOV, A.N., red.

[Petrography of Uzbekistan] Petrografiia Uzbekistana. Tashkent, Izd-vo "Nauka" UzSSR. Book 1. 1964. 445 p. (MIRA 18:1)

1. Akademiya nauk Uzbekskoy SSR, Tashkent. Institut geologii i geofiziki.

USMANOV, F.A.

Complicated structures of dikes in the Muzbel region. Uzb. geol.zhur. no.2:79-82 '58. (MIRA 12:2)

1. Institut geologii AN UzSSR.
(Chatkal Range--Rocks, Igneous)

USMANOV, F.A.

Dikes in the Ikhnach region and their relationship to formations of intrusives and skarns. Uzb. geol. zhur. no.2:15-23 '61. (MIRA 14:5)

1. Institut geologii AN UzSSR.
(Ikhnach Massif—Geology, Structural)
(Dikes (Geology))

USMANOV, F.A.

Relationship between dikes and postigneous formations in Koshmansay. Uzb.geol.zhur. 6 no.3:45-52 '62. (MIRA 15:6)

1. Institut geologii AN UzSSR.
(Tien Shan--Dikes (Geology))
(Tien Shan--Rocks, Igneous)

USMANOV, F.Kh., inzh.

Transfer of power network operations. Elek. sta. 36 no.6:80-83 Je '65.
(MIRA 18:7)

1. Bashkirenergo (for Usmanov).

USMANOV, G.R.; ZAL'TSMAN, Z.I., inzh.

Experiment in growing balsam poplar seedlings. Put' i put. khoz. 9 no.7:30 '65. (MIRA 18:10)

1. Kazakhskiy nauchno-issledovatel'skiy institut lesnogo khozyaystva (for Usmanov). 2. Tselinogradskaya distantsiya nasazhdeniy lesozashchitnykh lesonasazhdeniy (for Zal'tsman).

USMANOV,H.U., prof.

Main ways of modifying properties of cellulose. Cel. hirtie 10 no.2:42-48 F'61

1. Membru Corespondent al Academiei de Stiinte a R.S.S. Uzbeca, Directorul Institutului de Chimia Polimerilor.

SLAVNIN, A.I.; USMANOV, I.U.; TIKHONOV, V.P.

Effectiveness of the varnish of the Turkmen Dermato-Venereological Institute in the prevention of pustular diseases in cotton pickers. Med.zhur.Uzb. no.11:76-77 N '58. (MIRA 13:6)

1. Iz Uzbekskogo nauchno-issledovatel'skogo kozhno-venerologicheskogo instituta (direktor - dotsent V.N. Matveyev) i Respublikanskogo kozhno-venerologicheskogo dispansera (glavnyy vrach - S.Sh. Saipov).
(TURKMENISTAN--AGRICULTURAL LABORERS--DISEASES AND HYGIENE)
(COTTON PICKING--HYGIENIC ASPECTS)

SLAVNIN, A.I.; DMITRIYEVA, I.N.; DEGTYAREVA, N.A.; TAREYEVA, V.Ya.; BELUKHA, U.K.; USMANOV, I.U.

Resochin in the treatment of lupus erythematosus. Izv. AN Uz. SSR. Ser. med. no.2:45-49 '59. (MIRA 12:7)

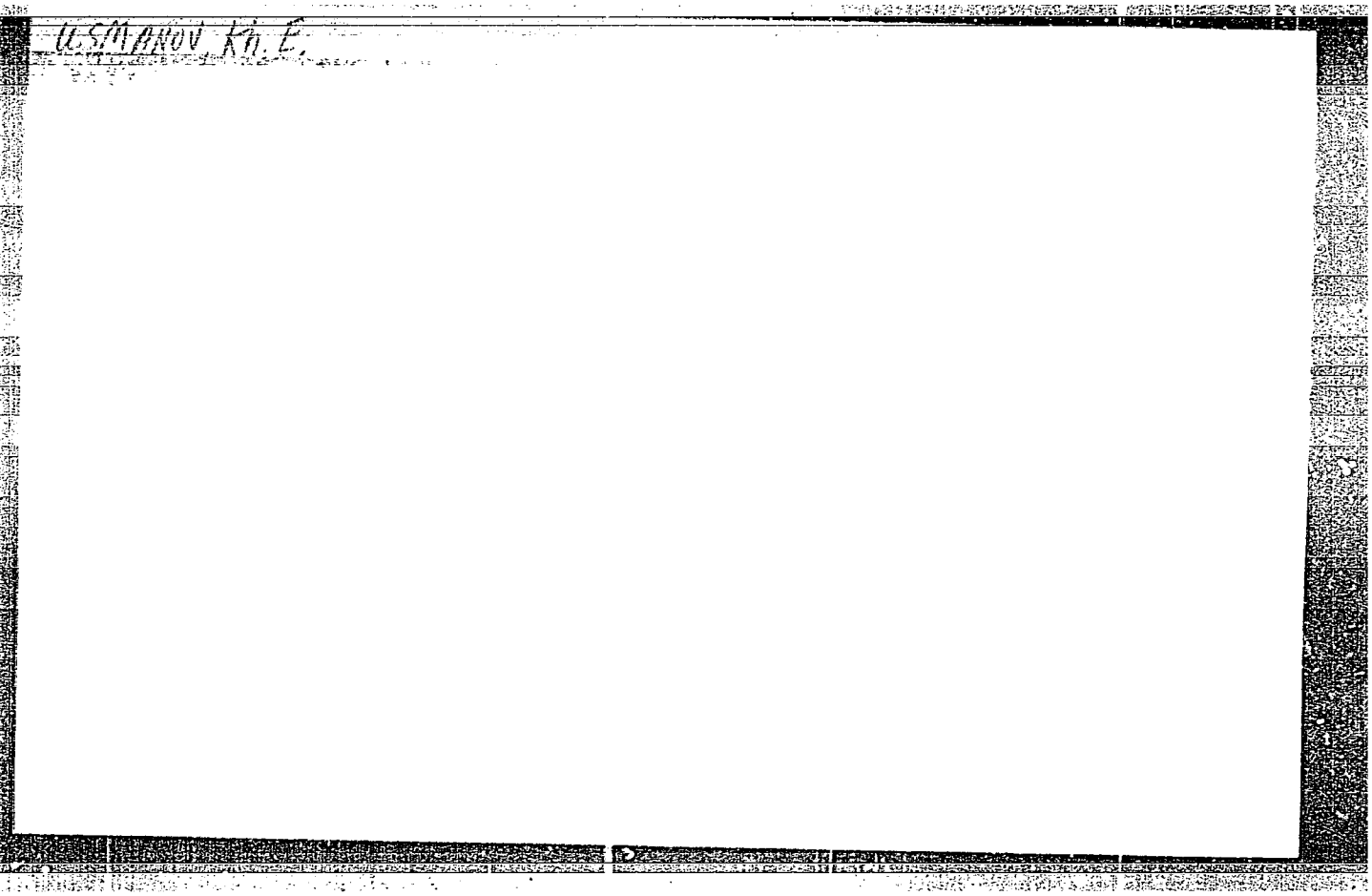
1. Uzbekskiy nauchno-issledovatel'skiy kozhno-venerologicheskiy institut.
(LUPUS) (QUINOLINE)

USMANOV, K.

The trend is toward specialization. Mest. prom. i khud. promys. 3 no.8:10 Ag '62. (MIRA 15:10)

1. Nachal'nik shveynogo tsekha Rizhskogo rayonnogo promyshlennogo kombinata.

(Riga--Clothing industry)



PIS'MENOV, A.V.; USMANOV, K.A.

Effect of water extracts from plants, forest litter, and soil on seed germination and radicle growth of pine, spruce, and larch. Trudy Inst. biol. UFAN SSSR no. 43:157-160 '65 (MIRA 19:1)

1. Bashkirskaya lesnaya opytnaya stantsiya Vsesoyuznogo nauchno-issledovatel'skogo instituta lesovodstva i mekhanizatsii lesnogo khozyaystva.

PIS'MEROV, A.V.; USMANOV, K.A.

Growth and development of conifer plantations depending on the types of silvicultural conditions of the Ufa Plateau cutting areas. Trudy Inst. biol. UFAN SSSR no. 43:255-258 '65
(MIRA 19:1)

1. Bashkirskaya lesnaya opytnaya stantsiya Vsesoyuznogo instituta lesovodstva i mekhanizatsii lesnogo khozyaystva.

VALIYEV, A.; SAMANOV, Zh.; USMANOV, Kh.

Division and comparison of Cretaceous sediments in the eastern part of the Barsakel'mes trough. Uzb.geol.zhur. 8 no.3:19-23 '64. (MIRA 18:12)

1. Institut geologii i razrabotki neftyanykh i gazovykh mestorozhdeniy Gosudarstvennogo geologicheskogo komiteta SSSR. Submitted Jan. 14, 1964.

USMANOV, Kh. G., Cand of Tech Sci -- (diss) "Vibro-unloading of free-flowing loads in enclosed Railroad Cars," Moscow, 1959, 18 pp (Moscow Institute of Engineers of Railroad Transport im Stalin) (KL, 1-60, 123)

USMANOV, Kh.G., aspirant

Unloading loose goods from boxcars by vibration. Izv.vys. uchab.zav.; mashinostr. no.2:165-176 '59. (MIRA 13:3)

1. Moskovskiy institut inzhenerov zheleznodorozhnogo transporta imeni Stalina.
(Loading and unloading)

USMANOV, Kh.G., inzh.

Investigating the unloading of bulk materials from box cars by vibration. Trudy MIIT no.122:138-150 '59.
(MIRA 13:5)
(Loading and unloading) (Vibrators)

USMANOV, Kh., G., inzh.

Investigating the frequency of natural vibrations on "unloader car" system. Trudy MIIT no.122:151-169 '59. (MIRA 13:5)

(Loading and unloading) (Vibrators)

USMANOV, Kh.G., kand.tekhn.nauk

Studying the dynamics of the unloading machine developed by the Central Scientific Research Institute of the Ministry of Railroad Transportation. Vest.TSNII MPS 21 no.4:19-22 '62. (MIRA 15:6)
(Loading and unloading--Equipment and supplies)
(Vibrators--Testing)

USMANOV, Kh.G., kand.tekhn.nauk

Friction moment in a ring pivot in case of a pericyclic motion.
Vest.mashinostr. 42 no.7:27-28 Jl '62. (MIRA 15:8)
(Friction)

USMANOV, Kh.G., kand.tekhn.nauk

Dynamics of the unit for unloading loose materials from boxcars. Izv.vys.uchab. zav.; mashinostr. no. 12:108-114 '63. (MIRA 17:9)

1. Moskovskiy institut inzhenerov transporta.

USMANOV, Kh.G., kand.tekhn.nauk

Calculating circular fricition butt joints. Vest.mashinostr.
44 no. 4:36-37 Ap '64. (MIRA 17:5)

USMANOV, Kh.G., kand. tekhn. nauk

Turbojet vibrator. Trudy MIIT no.195:125-132 '64.

Theory of a planetary vibrator. Ibid.:133-138 (MIRA 18:9)

USMANOV, Kh.G., kand. tekhn.nauk

Kinematic design of planetary transmissions with flexible links.
Priborostroenie no.9:6 S '65. (MIRA 18:10)

USMANOV, Kh. U. and KARGIN, V. A.

"Water Sorption and Structural Differences in Cellulosic Materials," Khim. i Fiz.Khim. Vysolomolekul. Soyedinenii, Dok. 7-oi Konf. po Vysokomolekul. Soyedineniyam, pp 169-181, 1952

Translation D 44977

USMANOV, Kh. U

Usmanov, Kh. - "Regarding the strength of cotton fiber", Izvestiya Akad. nauk UzSSR, 1948, No. 4, p. 68-84, (Resume in Uzbek), - Bibliog: 57 items.

SO: U-3042, 11 March 1953, (letopis 'nykh Statey, No. 10, 1949).

USMANOV, Kh. U.

USSR

Physico-chemical properties of cotton fiber. Kh. U. Usmanov. *Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci.*, 1953, 441-50 (Engl. translation).—See *C.A.* 48, 12414*h*.

H. L. H.

USMANOV, Kh. U.

Novelties in the physico-chemical investigation of cotton fibre. Kh. U. Usmanov (*Izvestia*, 1953, No. 3, 459—469).—The variations in contents of cellulose, fats, waxes, pectins, pentosans, mineral compounds, and reducing substances, mol. wt., sorptive properties, and tensile strength of cotton fibre during the growth of the plant are studied. The difference between the stress-strain curves for absolutely dry and damp fibre is discussed. R. C. MURRAY.

USMANOV, Kh. U.

USSR.

Assimilation of carbonates by the leaves of cotton plants. Kh. U. Usmanov, V. I. Dulova, R. Tillaev, and L. A. Vvedenskaya. *Doklady Akad. Nauk Uzbek. S.S.R.* 1953, No. 9, 22-3; *Referat. Zhur., Khim.* 1954, No. 21486.--During the flowering time 2 leaves of cotton plant were immersed into aq. solns. contg. C^{14}. The leaves were then immersed into an alk. soln. for 8 hrs. daily during 13 days followed by the detn. of their radioactivities while still on the plant. One month after the immersion of the leaves into the solns. contg. C^{14} the entire plant was analyzed for radioactivity. It was found that the amt. of C^{14} was highest at the place where the isotope was introduced into the plant; C^{14} was also found in the pods, stalks, and roots. Consequently, cotton plants can utilize CO_3^{--} when added through the leaves.

B. Wierbicki

USMANOV, Kh. U.

USSR

Relation between sorption and swelling of cellophane. Kh. U. Usmanov and Va. V. Pak. *Doklady Akad. Nauk Uzbek. S.S.R.* 1953, No. 12, 25-8; *Referat. Zhur., Khim.* 1954, No. 33330; cf. *C.A.* 47, 9909*f*. The relation between the swelling of cellophane and the amt. of H_2O sorbed by it was studied. Sorption and desorption isotherms at 25° were obtained gravimetrically with a spring quartz balance. The swelling in H_2O vapors (elongation) was studied in longitudinal and lateral directions to the machine direction. The sorption and desorption isotherms had an S-shape. The curves expressing the relation of elongation and relative pressure p/p_s and sorption (a) were also S-shaped. However, unlike $a(p/p_s)$ curves they were in their initial part concave and at higher p/p_s or a values convex. This shape of curves is explained by the fact that during sorption the spreading apart of mol. chains which ordinarily exert a screening effect on the action of the polar water moles is facilitated. The elongation in a lateral direction was almost twice that in the longitudinal direction. This anisotropy is apparently due to the difference in the orientation of chains in various directions. The sorption and desorption isotherms and the elongation curves had hysteresis loops which indicate a change in the structure of cellulose during the process of H_2O sorption.

M. Hosch

USMANOV, KH. U.

Textiles

Dissertation: "Causes of Differences of Physicochemical Properties of Cotton and Hydrocellulose Fibers." Dr Chem Sci, Order of Labor Red Banner Sci Res Physicochemical Inst imeni L. Ya Karpov, 15 Mar 54. (Vechernyaya Moskva, Moscow, 3 Mar 54)

SO: SUM 213, 20 Sept 1954

USMANOV, Kh.U.; NIGMANKHODZHAYEVA, M.S.

Mechanics of fibres of certain selective varieties of cotton. Trudy Inst.khim. AN Uzb.SSR no.5:3-22 '54. (MLRA 8:4)
(Cotton)

USMANOV, Kh.U.; SUSHKEVICH, T.I.

Study of the cotton fiber according to the molecular weight of its cellulose. Trudy Inst.khim. AN Uzb.SSR no.5:23-29 '54. (MLRA 8:4)
(Cotton)

USMANOV, Kh. U.

Chemical composition of the fiber of some cotton varieties. Kh. U. Usmanov and V. P. Shatkina. *Trudy Inst. Khim., Akad. Nauk Uzbek. S.S.R.* 1954, No. 5, 30–41.—A systematic chem. study of 6 varieties of cotton was undertaken to establish which variety will yield more cellulosic material and more useful by-products. The amts. of cellulose, Et_2O, and EtOH exts., pectins, pentosans, reducing sugars, and ash were detd. throughout the growing period of the cotton, the bolls being taken from the 2nd. and 3rd. sympodium. At the beginning of the growing period the amt. of cellulose and other materials differed greatly for the varieties studied; at the end, however, these differences became very slight, each variety showing a specific pattern. An assumption is made that the accumulation of the cellulose and other materials in the early stages can be related to the maturation time and can be used to predict the latter. Cf. McCall, *Textile Research J.* 21, No. 1(1951). Elisabeth Barabash

CH

(1)

USSR

Sorption of water on fused glucose and caramel. Kh. U. Usmanov and V. A. Kargin (Chem. Inst., Acad. Sci. Uzbek. S.S.R., Tashkent). Zhur. Fiz. Khim. 28, 234-8(1954); cf. U. and K. [illegible] 47 [illegible]. —The degree of sorption and desorption of water on fused glucose (I) and caramel (II) at 25° and 50° was measured as a function of relative humidity (W) [illegible] The tabulated data are [illegible] in comparison with similar data for cellulose [illegible]. The degree of sorption of water (S) on I at 50° is negligible for values of W up to [illegible]%, then rises to [illegible]% for W of 70%. At 25°, the increase of S with W is more gradual; when W is 82%, S is 13.8%. Upon desorption at zero humidity 3.[illegible] and 0.8% water are retained at 25 and 50° [illegible] when W is [illegible] and 48.6% when W is 81.5% [illegible]. The amounts of water retained on desorption are 1.3 and 4.4% at 25° and 50°, resp. The [illegible] of water is [illegible] to proceed through [illegible] water [illegible]

A study of the cotton fiber in the initial stage of development. Kh. U. Usmanov, T. I. Sushkevich, and R. S. Tillaev (Inst. Chem. Acad. Sci. Uzbek S.S.R., Tashkent). *Fiziol. Rastenii, Akad. Nauk S.S.S.R.* 2, 363-83(1955).—Local application of $C^{14}O_2$ to leaves by means of a movable glass chamber was used for a study of the nature of the process of fiber development in a cotton plant. Carbohydrate content of the cotton fiber revealed that in the early stage pod glucose and fructose are present. It is suggested that cellulose synthesis begins and ends in the same cotton filament directly from the monosaccharides present in it. A sharp decline in monosaccharides occurs at 16–30 days after flowering, depending on the variety of the plant. These periods are those of sugar "starvation" which must be overcome in order that the crop yield be raised. The most rapid accumulation of cellulose matter and decline of simple carbohydrates occurs in the early stage of fiber formation; relatively low mol. material is present at this stage indicating the probability of a polycondensation mechanism, rather than a polymerization mechanism for the formation of cellulose.

G. M. Kosolapoff

USMANOV-Kh-U.

2

Radiochromatographic method in chemical investigation of cotton. Kh. U. Usmanov and R. S. Tillaev. *Trudy Komissii Analit. Khim., Akad. Nauk S.S.S.R., Inst. Geokhim. i Analit. Khim.* 6, 488–501(1955); cf. Rachinskiĭ, *et al.*, *C.A.* 47, 7578i.—According to chromatographic data glucose and fructose are the main carbohydrates in cotton fibers. After the cotton leaves were immersed in $Na_2C^{14}O_3$ soln., a radiochromatogram of the carbohydrates in the fibers of the boll confirmed this. As the cotton bolls matured the total radioactivity of the sugars decreased but the ratio of the radioactivity of fructose to glucose stayed close to 1. Fibers from cotton bolls 5–40 days old were sepd. from the seeds and extd. by alc. at 60–70° for 6 hrs. The alc. ext. was filtered through columns of cation and anion exchange resins. The filtrate was evapd. to dryness at 60–70°. The residue was dissolved in 1 ml. H_2O and 0.05 ml. of this taken for a chromatogram, done by R.'s method. The solvent was PhOH satd. with H_2O, the developer ammoniacal $AgNO_3$ and resorcinol. Glucose and fructose were found. Cotton plant leaves were immersed in Na_2CO_3 soln., contg. $Na_2C^{14}O_3$, 12 days, with interruptions at dark times. After the sugars were sepd. on the chromatogram, it was dried and left 15 days on x-ray film. Glucose, fructose, and traces of other org. compds. were found. For quant. detn. of C^{14} in the sugars the alc. ext. was deionized and 0.2 ml. placed on Al foil. The sample was dried and its activity measured. The same soln. (0.5 ml.) was taken for a chromatogram. The glucose and fructose zones were cut apart and extd. with hot H_2O. The exts. were dried and their activities measured. E. M.

Inst. Chem., AS Uzbek SSR

Usmanov, Kh. U.

USSR/Plant Physiology Respiration and Metabolism H-2

Abs Jour : Referat. Zh - Biol., No 6, 25 March 1957, 22337

Author : Usmanov, Kh. U., Minigazieva, T. Sh.
Inst : Not given
Title : Examination of carbohydrate composition of cotton boll type 1306-DV by radiochromatography.

Orig Pub : Dokl. AN UzSSR, 1956, No 3, 27-30

Abstract : An early-ripening cotton plant variety 1306-DV distinguished for its outstanding early ripening was cultivated in 1954 on the test field of the Academy of Sciences, Uzbek SSR agricultural institute. From the first day of the cotton plant's blooming C^{14} was administered through the leaves in the form of $C^{14}O_2$. The fiber separated from the seeds was extracted by alcohol. The extract was evaporated to dryness, dissolved in water and passed through a layer of cations and anions; then it was paper chromatographed. One of the chromatograms was developed, the position of the spots was established, and it was used as the control. The corresponding portions of the undeveloped chromatograms were cut out, and extracted by steam. The extract was evaporated, dissolved in a small quantity of water and used for radiometry on a B assembly with the

Card 1/2

Abs Jour : Referat Zh - Biol., No 6, 25 March 1957, 22337

aid of a special β-ray end counter. The content of glucose and fructose in the cotton fiber variety 1306-DV decreased with the growth of the boll, but the glucose content was always greater than the fructose content. A rapid decrease of sugar content, which is expended on cellulose synthesis, appeared in the first 10-15 days of boll-formation, i.e. earlier than in formerly tested varieties 108-F (15-25 days) and 2-I-3 (20-30days).

USSR/Analytical Chemistry - Analysis of Organic Substances G-3

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 8584

Author : Usmanov, Kh. U., Yakubov, A. M., and Tillayev, R. S.
Inst : Academy of Sciences, Uzbek SSR
Title : Determination of Organic Acids by Paper Partition Chromatography

Orig Pub : Dokl. An UzSSR, 1956, No 5, 23-25 (with Uzbek summary)

Abstract : The adsorption of organic acids during partition chromatography on paper causes the formation of "comets" (the acids do not move in narrow bands but trail each other) which complicates the identification of the acids. The addition of small amounts of a volatile acid (e.g., CHOOH or CH_3COOH) to the mobile phase markedly decreases the adsorption and reduces the effect of the concentration on the retention time. The possibility of making chromatographic identification and quantitative estimation organic acids has been established by the determination of 46 acids of the aliphatic and aromatic series (using a water-saturated solution of n-butyl alcohol containing 5% CHOOH as the solvent, and a 0.04% solution of bromocresol

Card 1/2 -46-

USSR/Analytical Chemistry - Analysis of Organic Substances G-3

Abs Jour : Referat Zhur - Khimiya, No 3, 1957, 8584

blue in alochol as the developing agent). Rosolic, picric, and aminopicric acids do not require a developer for their qualitative determination since they form characteristic coloured spots.

Card 2/2

-47-

USMANOV, KH. U.

USSR/Physics of High- Molecular Substances D-9

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11545

Author : Usmanov, Kh.U., Yul'chevayev, A.A.

Inst : Central-Asia University, USSR.

Title : Packing Density of Cellulose Compounds and Their Wetting Heats.

Orig Pub : Dokl. AN UzSSR, 1956, No 8, 13-15

Abstract : A measurement was made of the specific integral wetting heat of cellulose from poplar pulp and was compared with the wetting heat of cotton fibers grades 108-F and 2-I-3. The values obtained were 18.1, 11.5 and 12.0 cal/g respectively. It is shown that the cellulose has a different packing density depending on the synthesis conditions in nature and on the conditions in which it is precipitated from the solutions. The structural differences of the

Card 1/2

USSR/Physics of High - Molecular Substances

D-9

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11545

macromolecules of the isomers -- natural cellulose and hydrate cellulose -- are not decisive causes for the difference in the densities between these two types of cellulose.

Card 2/2

USMANOV, Kh.U.; GANIYEV, B.Z.

Dynamics of the accumulation of gutta-percha and resins in eucommia leaves under conditions prevailing in Uzbekistan. Dokl. An Uz.SSR no.9:17-21 '56. (MIRA 12:6)

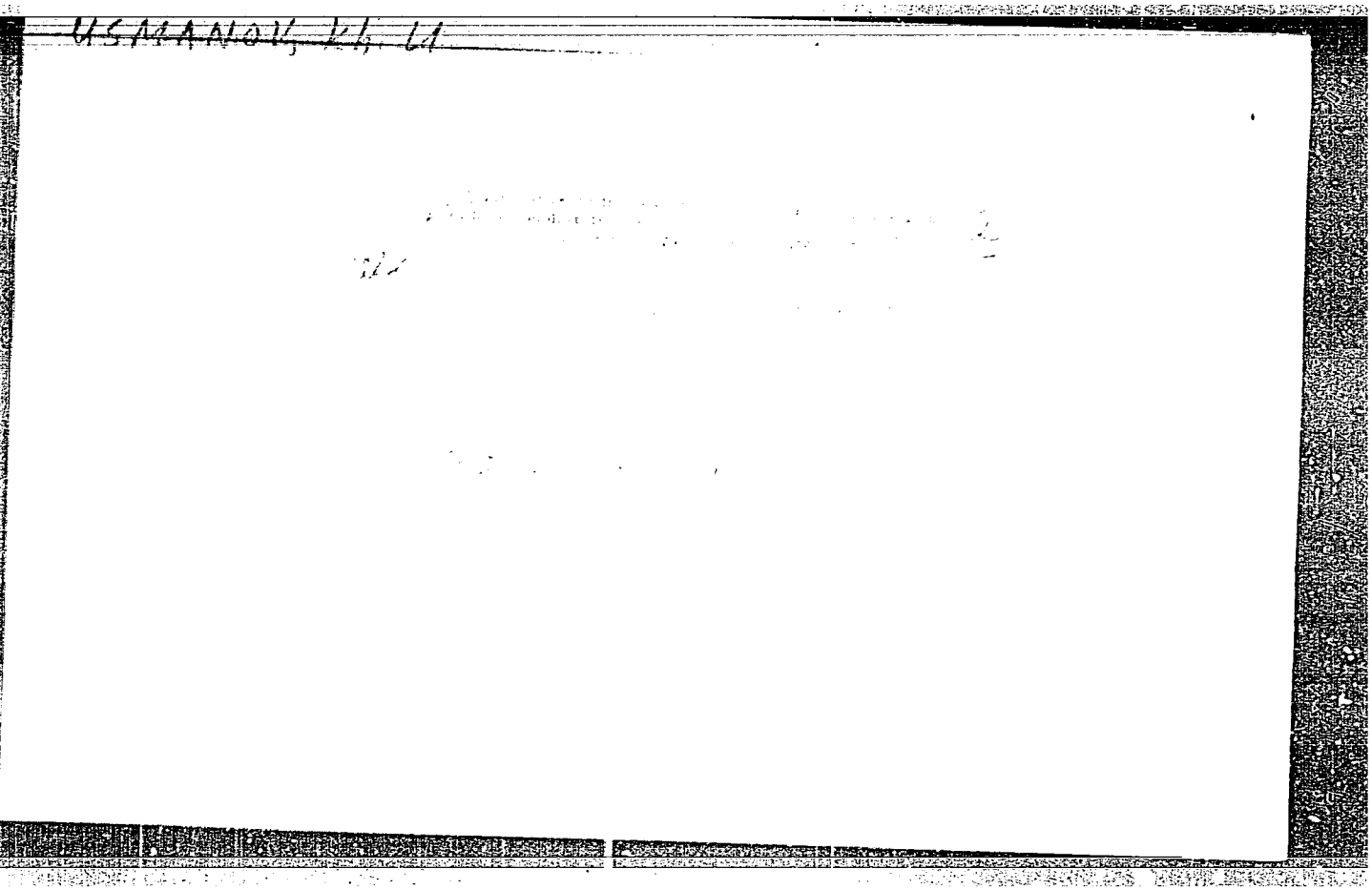
1. Institut khimii AN UzSSR. Predstavleno akademikom AN UzSSR S.Yu.Yunusovym.
(Uzbekistan--Eucommia) (Gutta-percha)
(Gums and resins)

Heat of wetting of viscose rayon. [illegible]

[illegible]

as the density of the rayon increases the value of Q [illegible] ... small amts. of H_2O [illegible] creased

J. J. Bikerman



USMANOV, Kh.U.; SHATKINA, V.P.

Accumulation of cellulose in cotton bolls located on different sympodia. Dokl. AN Uz. SSR no.7:17-19 '56. (MIRA 12:6)

1.Institut khimii AN UzSSR. Predstavlene akad. AN UzSSR S.Yu. Yunusovym.

(Cotton) (Cellulose)